

MATHEMATICS AND MOBILE LEARNING

Fayez Sayed
Zayed University
Khalifa City B, Abu Dhabi, UAE, P.O.Box: 144534

ABSTRACT

The wide range of Mathematical Apps targeting different mathematical concepts and the various types of mobile devices available present a demanding and challenging problem to the teaching and learning in the field of mathematics. In an attempt to address this issue, few Apps were selected, implemented and tested in this work.

KEYWORDS

Mobile Devices, Mathematical Apps, functions

1. INTRODUCTION

The aim of this activity is to test three selected Apps, namely MyMath, EigenMath and PhotoMath, for capability, friendliness and impact on learning and applying mathematical concepts. The three Apps were chosen from a previously collected and categorized list. A randomly selected class of 24 students, split into 6 groups was presented with the task of solving algebraic equations and calculus problems using the given Apps on mobile devices.

2. BODY OF PAPER

Challenge:

The wide range of Mathematical Apps and the various types of mobile devices available present a demanding and challenging problem to learners.

Methodology:

Collect a number of popular Apps, test them and classify them according to their math capability, friendliness and impact on learning.

Authentic Environment:

- Classrooms, students are the main party in this investigation.
- Learners are presented with a list of selected apps alongside a set of typical mathematical problems.

Learning Outcomes:

By the end of this Activity, participants will be able to:

- Apply problem-solving techniques using mobile devices.
- Use these apps skillfully to solve given algebraic and calculus equations.
- Store and share their work with other participants.

Activity:

1. Sketch the following function $f(x) = x^3 + 2x^2 + 3x - 1$
2. Differentiate this function
3. Find the zeros of the derivative function
4. Sketch a graph of the derivative function

Recommended Apps: PhotoMath, Mymath and Eigenmath.
You can use other online Apps/websites

Discussion:

Samples of participants feed back on capability and friendliness of Apps:

PhotoMath: this App solves equations by scanning the camera over it however,

- Does not support handwritten text.
- Solves easy math questions only

Mymath:

- Recognizes handwritten text but limited to solving and graphing algebraic functions.
- was kind of helpful, but the scanning hand written equations was not accurate most of the time.

Derivative calculator website for windows users:

<http://www.freemathhelp.com/derivative-calculator.php>

- Excellent website that find the derivative of any algebraic expression.

EigenMath:

- This App tackles various mathematical tasks such as differentiating, integrating and sketching functions however, needs more practice.

2.1 Figures and Tables

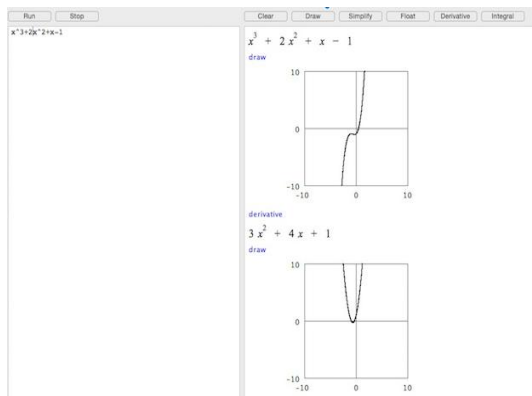


Figure 1. Algebraic solution using EigenMath

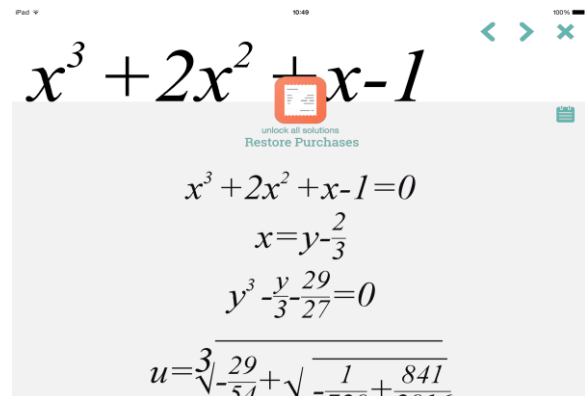


Figure 2. Derivatives and sketches using EigenMath

Table 1. A list of various Math Apps

| Apps | iPhone | iPad | Android | Mac Laptop | Descriptions |
|--------------------------|--------|------|---------|------------|---------------------------------------|
| MyScript Calculator | √ | √ | | | Solves hand written calculations |
| Mathway | √ | √ | | √ | Solves general math problems |
| Fraction Calculator Plus | √ | √ | | | Fractions Calculator |
| Quick Graph | √ | √ | | √ | Graphic calculator |
| yHomework- Math solver | √ | √ | | | Solves step by step |
| FX Math Solver | √ | √ | | | Solving step by step |
| FX Algebra Solver | √ | √ | | | Solving step by step |
| FX Calculus solver | √ | √ | | | Solving step by step |
| MathRef | √ | √ | √ | | Math Education App (Formulas) |
| PhotoMath | √ | - | | - | Scan and Solve Equations using iPhone |
| Geogebra | | √ | √ | √ | Geometry, Algebra and Statistics |

3. CONCLUSION

Clearly indicate advantages, limitations and possible applications.

- Students enriched the activity with additional Apps they found themselves which generated a bigger list of Apps.
- Faster way of finding solutions in comparison to the classic approach, as participants were not hindered by tedious algebraic and calculus calculations. This lead to more time devoted to analysing results.
- Students with challenged algebraic skills worked well with the advanced concepts of calculus.
- This work is limited to three Apps and a specific topic of maths.
- More Apps should be studied and linked to relevant math concepts, an initial attempt is presented in Table-1.

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Book

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Journal

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